

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

WATERING FACILITY

(No.)

CODE 614

DEFINITION

A device (tank, trough, or other watertight container) for providing animal access to water.

PURPOSE

To provide watering facilities for livestock and/or wildlife at selected locations in order to:

- protect and enhance vegetative cover and improve natural resource conditions, through proper distribution of grazing;
- provide erosion control, improve water quality, and improve nutrient distribution on pastures, through better grazing land management; or
- protect streams, ponds and water supplies from contamination and physical damage by providing animal resources access to an alternative source of drinking water.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all land uses where there is a need for new or improved watering facilities.

CRITERIA

Criteria Applicable to All Purpose

General. A trough or tank shall have adequate supply and capacity to meet the water requirements of the livestock and/or wildlife. This will include the storage volume necessary to carry over between periods of replenishment.

Materials. All materials shall have a life

expectancy that meets or exceeds the planned useful life of the installation. Common construction materials are reinforced concrete, steel, fiberglass, plastic and wood. All designs shall meet the industry standards for the material being used. Generally applicable design requirements and procedures can be found in the documents referenced at the end of this standard.

A reinforced concrete trough or tank shall be constructed of good quality concrete using sound, clean aggregates. The concrete mix shall be such that it will produce a compressive strength of 3,000 psi at 28 days. A concrete cast trough or tank shall be reinforced with steel as required by the Natural Resources Conservation Service (NRCS), National Engineering Manual (NEH) Part 636, "Structural Engineering" and American Concrete Institute (ACI) - 318.

Galvanized steel tanks shall have a minimum thickness of 20 gauge.

Plastic and fiberglass structures shall be made of ultraviolet resistant materials or shall have a durable coating to protect the structure from deterioration due to sunlight.

Watering Facility Components. Water level control and/or overflow facilities shall be provided as appropriate. Water level control and /or overflow facilities will be set to provide a minimum of 1 inch of freeboard below the top of the trough or tank. Valves and pipes shall be protected by shields or covers to prevent damage by livestock and/or wildlife. Full flow automatic water level valves shall be provided if being used with a portable trough or tank. All automatic water control devices shall have an inline shut off valve located at or near the trough or tank. All valves and water control

devices shall allow the minimum inflow rate. If an overflow pipe is used it shall be piped to a stable or suitable point of release. All pipe and fittings shall be new galvanized steel, copper, bronze, or plastic in accordance with NRCS Conservation Practice Standard Code 516, "Pipeline", and shall be connected in a manner to prevent leakage. The trough, pipes, and water control valves shall be protected from freezing and ice damage. Freeze-proof troughs or electric heaters may be used.

When a roof is placed over the trough or tank to provide shade, the roof shall be designed for appropriate loads and shall be durable to withstand anticipated livestock and wildlife activities.

All watering facilities shall be installed in a manner, which will prevent the facility from being overturned.

All exposed pipes, fittings, and appurtenances shall be protected from rust or ultraviolet protected as appropriate.

Location. The trough or tank shall not be located adjacent to any well head. A separation distance of at least 50 feet is needed for wellhead protection ("Water Well Rules, Regulations, and Standards", State of Louisiana, November 1985). If possible locate the trough or tank down gradient from the well head. The location shall have easy access by the livestock and/or wildlife

Additional Criteria Applicable to Livestock

General. Troughs or tanks must provide the daily water requirement of the livestock through *storage and replenishment* and provide access to the entire herd within a reasonable period of time, usually 1-3 hours. Where water supplies are dependable and livestock are checked regularly, troughs or tanks with little water storage capacity may be used.

Water Supply and Capacity. The trough or tank must be connected to an adequate and dependable water supply such as a well, spring, pond, or municipal water supply. Table 1 shall be used in determining the minimum daily water requirements, capacity, and depth of permanent watering facilities.

Table 1 – Minimum Requirements of

Permanent Watering Facilities

Kind of Livestock	Capacity gal	Depth inches	Daily Requirement ^{1/} gal per head per day
Beef cattle	50	12	12
Horse	50	12	12
Dairy Cattle drinking only			
Lactating	100	12	25
Non-lactating	50	12	15
Sheep and Goats	15	6	2
Swine	15	6	4

^{1/} These requirements vary with climatic conditions, kinds of feed, size of animals, and other factors and may be increased as necessary.

A trough or tank will be in demand approximately two hours in the morning and two hours in the afternoon by grazing livestock. One half of the total daily water requirement will need to be supplied during the morning and one half during the afternoon peak usage periods.

The required capacity of the trough or tank will be the value from Table 1, for the appropriate livestock, or the value calculated from the following formula, whichever is greater:

Capacity, in gallons = (no. of head)(1/2 of daily water requirement from Table 1) – (inflow rate in gal. /min.)(2hrs.)(60min. /hr.)

For troughs or tanks where a pond supplies the water, the pond must have sufficient capacity to store the livestock water requirements for 30 days and provide a minimum elevation head of 4 feet (anticipated water surface elevation during late summer/early fall of the pond surface).

Portable Trough or Tank. A portable trough or tank is one that is moved periodically to facilitate a rotational grazing system or moved to reduce the impact of livestock to the area around a watering point. The minimum volume for a portable trough or tank, as part of a portable watering system, shall be 25 gallons. The minimum water supply rate to the trough

or tank shall be 5 gallons per minute. Full flow automatic water level valves shall be used. This system will supply water for a maximum of 80 beef cattle or equivalent, based on the water requirements.

Water System Storage Capacity. Watering system storage capacity is critical to animal health. System storage capacity shall be determined based on the reliability of the water source and the availability of alternate water sources (such as a pond, lake, stream, etc.) to livestock on the land unit.

The minimum watering facility capacity shown in Table 1 is the only storage required when the source of water is reliable and the livestock is checked regularly, or if an alternate source of water (such as a pond, lake, stream, etc.) is accessible to the livestock on the land unit. When the above conditions cannot be met, the minimum watering system storage capacity shall be 2 days. The minimum watering system storage capacity may be provided in a combination of trough or tanks in adjoining pastures.

Site Protection. The site shall be well drained, if not, drainage measures shall be provided when installing watering facilities on soils rated with wetness limitations. The area beneath the trough or tank, and an area of at least 8 feet outside of the trough or tank's perimeter, shall be graveled, paved, or otherwise treated to provide a firm foundation and reduce erosion, in accordance with NRCS Conservation Practice Standard Code 561, "Heavy Use Area Protection". All treated surface areas shall slope away from the trough or tank to prevent ponding of water. A portable trough or tank used in livestock rotational grazing systems is not required to have heavy use area protection if the trough or tank is moved often enough to prevent bogging.

CONSIDERATIONS

This practice may adversely affect cultural resources and must comply with NRCS General Manual 420, Part 401.

Topography should be evaluated to minimize trail erosion and flooding erosion from tank overflow.

Troughs or tanks should be located so that

loafing, by livestock, is not encouraged. Troughs or tanks placed under trees encourage loafing and creates maintenance problems from falling leaves. If water temperature is a concern, the trough or tank can be partially buried or a roof built to provide shade.

For cattle, provide room for at least 1 animal in 20 to drink from a watering facility at a time. For lactating dairy cattle provide room for at least 1 animal in 15. Plan on 20 inches of perimeter for circular tanks and 30 inches of length for rectangular or square tanks for each animal drinking.

For livestock, locate watering facilities to fully utilize grazing lands. To get maximum use of available forage, water must be within a quarter mile (1,320 feet) of the forage-producing site on level and undulating topography. Where land slopes exceed 25 percent, this distance should be reduced to 600 feet (NRCS, "National Range and Pasture Handbook" (NRPH), September 1997). Lactating dairy cattle watering facilities should be located within 300 feet of where grazing occurs ("Prescribed Grazing and Feeding Management for Lactating Dairy Cows", New York State Grazing Lands Conservation Initiative and USDA NRCS, January 2000).

The size of animals (domestic and wildlife) using the facility should be considered. Watering facilities should be designed so small animals (e.g. calves, goats, deer, etc.) can access the water. Escape ramps for birds and small animals should be considered.

PLANS AND SPECIFICATIONS

Plans and specifications for installing troughs and tanks shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. If the trough and/or tank are a component of a system that includes additional conservation practices, the information necessary to construct these additional practices will also be conveyed on the plans.

Development of plans will be guided by NRCS Engineering Field Handbook, Chapter 5, and shall be in accordance with NRCS National Engineering Manual, Parts 541 and 542.

OPERATION AND MAINTENANCE

An O&M plan specific to the type of installed trough or tank shall be provided to the landowner. The plan shall include, but not be limited to, the following provisions:

- check for debris, algae, sludge or other materials in the trough which may restrict the inflow or outflow system;
- check for leaks and repair immediately if any leaks are found;
- check the automatic water level device to ensure proper operation;
- check to ensure that adjacent areas are well protected against erosion;
- check to ensure the outlet pipe is freely operating and not causing erosion problems; and
- prepare guidance for winter weather, such as adding material in the storage area to allow for ice expansion without damage.

Algae and iron sludge accumulation should be addressed in areas that are known to cause this water quality problem. Chemicals such as copper sulfate and chlorine can be recommended as needed, as long as local rules and regulations are followed.

REFERENCES

Timber, National Design Specification for Wood, American Forest and Paper Association
 Steel, Manual of Steel Construction, American Institute of Steel Construction
 Masonry, Building Code Requirement for Masonry Structures, ACI 530, American Concrete Institute
 NRCS General Manual 420, Part 401
 NRCS National Engineering Manual, Parts 541 and 542
 NRCS National Engineering Field Handbook, Part 650, Chapter 5
 NRCS National Range and Pasture Handbook, September 1997
 Prescribed Grazing and Feeding Management for Lactating Dairy Cows, New York State Grazing Lands Conservation Initiative and USDA NRCS, January 2000